

Fig. 1.

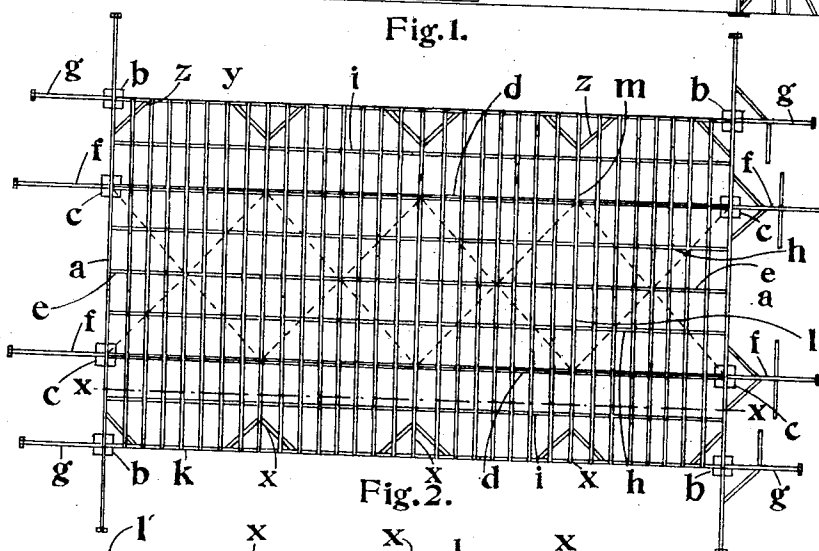


Fig. 2.

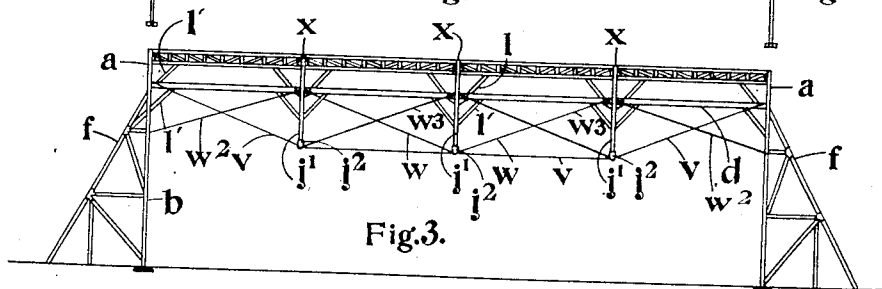


Fig. 3.

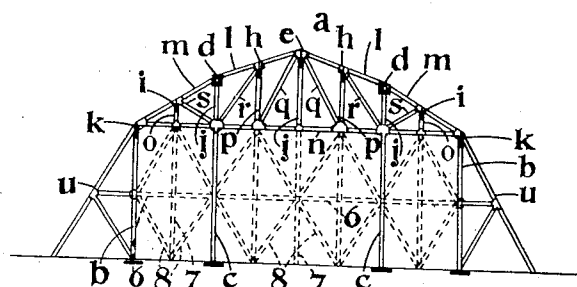


Fig. 4.

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RELATING TO STRUCTURES.

1,349,980.

Specification of Letters Patent. Patented Aug. 17, 1920.

Application filed April 1, 1919, Serial No. 286,631. Renewed July 10, 1920. Serial No. 395,340.

To all whom it may concern:

Be it known that I, THOMAS EDGAR RICHARDS, a subject of the King of Great Britain and Ireland, residing at 19 St. James street, London, S. W., England, have invented certain new and useful Improvements Relating to Structures, of which the following is a specification.

This invention relates to structures, and more especially to structures intended for the housing of aeroplanes, and has among its objects to provide a structure for the purpose which permits of the aeroplane passing into the structure from the front, and passing out through the back. Thus according to the invention the roof is supported at the respective ends from the ground without any necessary intervening support, while at the eaves longitudinal members or purlins are provided for the reception of sliding doors or canvas whereby the structure may be readily opened at the front or at the back for the reception or the release of the machine.

The invention comprises the construction which is hereinafter described.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is an elevation of a hangar provided according to the invention,

Fig. 2 is a corresponding plan,

Fig. 3 is a sectional elevation on the line $x-x$ Fig. 2, and

Fig. 4 is a corresponding end elevation.

In carrying the invention into effect according to one construction, I provide at each end of the structure a roof truss a supported from the ground upon posts or pillars b . A pillar b is provided to support the truss at each end, and two or more pillars such as c may be provided in intermediate positions to extend upwardly to a point beneath the ends of intermediate ridge members d provided midway between the main ridge member or apex purlin e and the eaves purlins h on each side.

The truss a consists of rafter members l and m , the posts j , the horizontal member n , posts o and p and struts q , r and s . In line with the truss, rakers u are provided for support against transverse stresses.

At the points at which the side ridge members d are connected to the trusses a , the trusses a are supported by braced rakers or struts f while moreover purlins h and i

extend longitudinally in intermediate positions between the main ridge member e and the side ridge members d and between the latter and the eaves purlins h respectively, and braced rakers or struts g are applied to and in line with the ends of the respective longitudinal members or purlins h at the eaves, so as thus to give adequate support against endwise pressure.

The side ridge members d are braced, and for this purpose a number of vertical posts j may be provided at intervals in the length of the respective side ridge members reaching to a point approximately level with the eaves purlins h and a little beneath the level of the horizontal member n of the trusses a , and a tension member or brace v may extend between the ends of the respective posts j and pass upwardly to the respective opposite ends of the respective ridge members d .

The roof it will be understood consists of the main ridge member or apex purlin e and two side ridge members d , the purlins h and i and the eaves purlins k , all of which are parallel, and the end trusses a and the corresponding trusses x in intermediate positions of the form substantially the same as the end trusses a and consisting of the same elements, but unsupported from the ground, there being no posts beneath these trusses x . Furthermore the trusses x the posts j of each truss x which correspond in position to posts j of the end trusses, extend each a little below the horizontal member n for the reception of a shoe f with which the tension member v engages.

In the illustrated construction there being three intermediate trusses x the two posts j of the middle truss may have tension members w extending from the shoes f at their lower extremities to the ridges d as illustrated in Fig. 3 in connection with one of the ridges d . By such means longitudinal trussed girders are formed each comprising one of the ridge members d and these form part of the transverse intermediate rafter trusses x . Thus the roof is well adapted to carry its own weight supported upon the end trusses and to carry the weight of the canvas, tarpaulin or other roofing as well as to resist wind pressure from without.

Inasmuch as the interior of the structure is accessible to wind from a long open front

or back, means are provided to strengthen or enforce the roof against upward pressure. For this purpose tension members $w^2 w^3$ extend from the respective horizontal members $d e d$ at a position corresponding to that of the adjacent intermediate truss x , while similar tension members $w^3 w^3$ extend from the shoes j^2 at the lower ends of posts j^1 of the said adjacent intermediate trusses x toward the middle of the roof where they are secured to the corresponding ridge member. It will thus be understood that there are three sets of tension members w^2 at each end and two sets of tension members w^3 on each side of the middle of the structure. Between the intermediate trusses $x x x$ and between the end trusses and the adjacent intermediate trusses rafter members y are disposed at intervals for the support of the roofing.

The roof may be otherwise braced by such means as angular struts z while furthermore struts such as $1'$ may be provided between the end trusses and the respective ridge members and between the respective bridge members and the posts $j^1 j^1$. A runway 2 may be carried from the eaves purlins h and this runway may extend across the ends of the structure on the same level hung from the inside of the lower members of the end trusses $a a$, thus forming a runway of a substantially quadrilateral figure with curves of suitable radius at the corners, the parts of the runway mounted within the structure being disposed close to the end trusses and being suitably supported therefrom. From this runway sliding doors 3 may be suspended upon wheels or rollers 4. These doors may be made relatively light from ordinary timber frames extending from the respective purlins to the ground and these timber frames may be covered with canvas 5.

It will be understood that the runway 2 may be provided as illustrated continuous so that one half the number of sliding doors intended for completely inclosing the front may be moved outward toward the ends of the hangar and on to the transversely disposed part of the runway into the interior of the structure and the other half to the other transversely disposed part of the runway at the opposite end, while similarly the sliding doors provided to completely close the back of the structure may pass outwardly and on the respective diverted parts of the runway mounted at the ends and within the structure, or instead separate runways may be provided in positions near the respective ends of the structure, two runways for the reception of the sliding doors from the front and the others for the reception of the sliding doors from the back.

Cross bars 6, 7 and 8 may be provided

between the posts $b b$ and $c c$ at each end of the hangar in order to form a support for canvas or other material to extend over the whole end including the end truss either on the inside or upon the outside.

The elements of which the roof and trusses are formed may be made of timber. The central ridge member or apex purlin e and the purlins $h h$, $i i$ and $k k$ may be provided as braced frames as illustrated and these respective parts may be provided of corresponding parallel sections to extend from truss to truss. The ridge members $d d$ and all the posts and members forming the end trusses $a a$ and the intermediate trusses $x x x$ are advantageously formed of planks of wood laid side to edge to form a hollow rectangular section, the respective planks being suitably secured and bound together to form an integral element. The ridge members $d d$ are advantageously provided in sections of a length corresponding to the sections of the purlins, while the rafter members y are advantageously provided from plain timber. The respective parts forming the end and intermediate trusses are advantageously connected together and to the ends of the respective purlins and ridge members by suitable junction fittings in a manner similar to that described in the specification of a pending application, Serial No. 255,355, filed September 23, 1918. The roof may advantageously be lifted into position in separate complete sections comprising parallel sections of ridge members and purlins connected to the trusses and having the rafter members mounted in position, the whole sections of the roof being built together upon the ground and each section lifted successively into position means of derrick poles, erection towers or gentrys or by similar means. The whole roof, however, completely constructed on the ground may be lifted from erecting towers temporarily or permanently forming a part of the end trusses in the manner described in the specification of a pending application, Serial No. 286,984, filed April 2, 1919.

I claim:

1. In a structure for housing aeroplanes, in combination, a main ridge member, side ridge members, braces therefor, eave purlins, braces for the whole, end trusses supporting the ends of the ridge and the braced roof whereby a clear open space is left from end to end.

2. In a structure for housing aeroplanes, in combination, a braced main ridge member, braced side ridge members, end trusses, intermediate transverse trusses, eave purlins connecting and supported by the end and intermediate trusses, runways supported on the eave purlins, and doors mounted so as to be suspended from and to move in said runways.

3. In a structure for housing aeroplanes, in combination, braced ridge members, braced side ridge members, eave members, connecting said bracing means, end trusses, 5
braces between the parts aforesaid, supports for the end members, runways on the eave members and the end trusses, and doors suspended in said runways, the doors being movable in the runways from the sides into 10
the ends of the structure so that the sides may be opened.
4. In a structure for housing aeroplanes, in combination, a main ridge member, side ridge members, braces therefor, eave mem- 15
bers, braces tying all together, end supports, braces for said end supports, the bracing for the ridge members being secured to said supports, a quadrilateral shaped continuous runway supported in the eaves and end 20
members, and doors suspended in said runway by means of which doors and runway the sides may be closed or opened completely so that an aeroplane may enter at one side and leave at the other, the interior being un- 25
obstructed.
5. In a structure for housing aeroplanes, in combination, a ridge member, posts and tension members extending below and bracing said member, eave members, the posts of 30
said ridge member extending to or below the level of the eave members, intermediate members and bracing end trusses, bracing for said end trusses and means whereby a braced end supported roof is provided, and means whereby the sides may be completely 35
closed or may be left entirely open for the entrance and exit of an aeroplane passing through from side to side.
6. A roof structure, comprising a plurality of spaced trussed girders, end sup- 40
ports for said girders, and a plurality of transverse trusses united with and supported by said trussed girders, vertical members of said trussed girders forming members of said transverse trusses, and 45
said transverse trusses extending at each end thereof beyond the adjacent girders as cantalivers.
7. A roof structure, comprising a plurality of spaced trussed girders, end sup- 50
ports for said girders, and a plurality of transverse trusses united with and supported by said trussed girders, vertical members of said trussed girders forming members of said transverse trusses, and said transverse 55
trusses extending at each end thereof beyond the adjacent girders as cantalivers, eave purlins connecting the ends of said transverse trusses, additional purlins connecting said transverse trusses between the girders and 60
between the girders and the eave purlins, and rafters between the transverse trusses carried by said purlins and the girders.

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